simply want to clarify for the record that we don't know the circumstances under which these documents were stapled together. We have a representation that they were stapled together incorrectly. We just don't know the circumstances under which that occurred.
BY MR. PUTNAM:
Q Mr. Suttie, first of all, am I right that the document you have in front of you that has the exhibit sticker of Suttie 11 on it contains, in addition to the pages that I just read for the record, pages HSA 176477, 78 and 79?
A Yes, it does.
Q Are those three pages part of the rest of the document as it was originally created by you?
A This document was not created by me.
Q Those last three pages? Are those three pages pages that were attached to the fax that Mr. Fleming sent to you?
A I do not know.
Q Do you see on Mr. Fleming's fax cover sheet that he says that the first page here is Page 1 of 13?
A I do.
Q Would you agree with me that counting back, the 13th page is the one that is HSA 1614767
A So the question, is the last page 1476?

Q Yes, sir. Is that the last page of what Mr. Fleming sent you, based on the page count on the first page of the fax and also based on your reference on the first page of the fax to the second-to-last page, which I believe is HSA 1614757
A The answer to your question is yes.
Q Okay. Can you please remove from the exhibit pages HSA 161477, 478 and 479.
MR. MCCRACKEN: I would like to -- can we go off the record for just a moment?
MR. PUTNAM: Sure.
(Discussion off the record.)
(Deposition Exhibit 12 marked.)
MR. PUTNAM: For the record, at your request, Mr. McCracken, we have marked as Suttie Exhibit 12 pages HSA 161477, 478 and 479 that were the three pages originally inadvertently attached to Suttie Exhibit 11.
Q Mr. Suttie, do you have Exhibit 11 in front of you?
A Yes.
Q And am I correct that Exhibit 11 as it currently sits in front of you starts with HSA 161463 and goes through HSA 1614767
A Yes.
Q Am I correct that you circulate -- and this is

the fax that Bob Fleming sent to you, correct?
A It appears to be.
Q And am I correct that you then circulated this document to a number of people inside Sundstrand in San Diego?
A Yes.
Q And that's the list of the four people in the column on the left bottom middle of the page; is that right?
A Yes.
Q Was Peg your secretary in November 1992?
A Yes.
Q And so am I correct that this note was both a note to your secretary to send copies to the individuals you listed, and then a note that you wanted to convey to those individuals, correct?
A Yes.
Q And am I correct that these four individuals you were sending it to were all people who were working at the time on developing the control systems for the APS 3200?
A Yes.
Q Am I correct that the document that is attached to the cover page is a document that describes the operation of Allied Signal's GTCP 331-350 APU?

MR. MCCRACKEN: Objection; ambiguity. Ambiguous.
THE WITNESS: I can't answer that without reading every page.
BY MR. PUTNAM:
Q Well, when you received the document from Mr. Fleming, then passed it on to your colleagues, what did you understand the document to be?
A I don't recall what I thought the document to be back then.
Q Take as much time as you need to and tell me now what the document is.
A Some of the pages have reference to GTCP APUs.
Q And is it your understanding that the pages that don't explicitly mention the Allied Signal APU by name are nonetheless talking about the operation of Allied Signal APUs?
A That was -- that's a reasonable assumption.
Q Where did Mr. Fleming get this document from?
A I do not know.
Q Did you ever ask him?
A No.
Q Is Mr. Fleming still an employee of Sundstrand?
A Yes.
Q Now, what did you say -- what did you mean by

this cover note that said you liked the plot on the second-to-last page of the document Mr. Fleming sent you?
A I thought it was a good representation of data.
Q In what sense?
A It was a clear portrayal of information.
Q And am I correct that your note on the first page indicated that you thought Sundstrand should create a comparable depiction for its 3200 APU?
A Yes.
MR. PUTNAM: Let's take our lunch break.
(Lunch recess taken from 12:15 p.m. to 1:25 p.m.)
MR. PUTNAM: Back on the record.
(Deposition Exhibit 13 marked.)
BY MR. PUTNAM:
Q Mr. Suttie, I've handed you what the court reporter has marked as Suttie Deposition Exhibit No. 13 which is a three-page document with production numbers HSB 215504 through 506. Do you have that document in front of you?
A Yes.
Q And is that your handwriting near the bottom of the page -- first page of Suttie Exhibit 13?
A Can you be more specific?

Q Do you see the word "Pete"?
A Yes.
Q Is that your name and your handwriting?
A Yes.
Q And does that show that you distributed this memo to a number of members of the team who was working with you on developing the APS 3200 in June 1992?
A Yes.
Q And this is a Coordination Memo -- the original document here is a Coordination Memo written by Mr. Tuquoi; is that right?
A Yes.
Q And what did this Coordination Memo relate to?
MR. MCCRACKEN: Objection. There's no indication that he even remembers this document.
THE WITNESS: I don't recall.
BY MR. PUTNAM:
Q Okay. Can you look at it and tell me what the memo relates to?
MR. MCCRACKEN: Again, I object to the line of the questioning. I'll make this one comment as a general objection that it's not relevant to the issues in the lawsuit.
THE WITNESS: The memo covers delta P measurement.

BY MR. PUTNAM:
Q Do you see here in the part written by Mr. Tuquoi he says, "We don't see any reason to have a different signal on the qual. APS 3000." Do you see that?
A Yes, I see it.
Q Do you understand "qual." to be an abbreviation for something there?
A Yes, I do.
Q What's that?
A Qualification.
Q What's the signal that's being talked about in that sentence?
A I don't know.
Q It's the signal for measuring delta P, isn't it?
A One could assume that.
Q Am I correct that Mr. Tuquoi's conclusion here is that you should use for the APS 3000 the same delta P measurement signal that is used on the Allied Signal 331-350?
A Can you repeat that, please.
(Last question read.)
THE WITNESS: I don't know what Mr. Tuquoi's conclusion was.

BY MR. PUTNAM:
Q Well, taking a look at the memo, isn't that what you understand by the memo here?
A One could assume that.
Q Did you ever discuss with Mr. Tuquoi this test that he was conducting here on the Allied Signal 331-350?
A I don't recall.
Q Do you remember why -- you see in the fourth line he says, "No module where available before," fourth line down?
A I see that line, yes.
Q Do you know why it was that Mr. Tuquoi had not been able to test the Allied Signal APU before the date of this document?
A I do not.
MR. PUTNAM: May I ask the court reporter to mark this as Suttie Exhibit 14.
(Deposition Exhibit 14 marked.)
BY MR. PUTNAM:
Q Mr. Suttie, the court reporter has handed you what's been marked as Suttie Exhibit 14 which is a one-page Coordination Memo with production number HSB 215503. Do you have that document in front of you?
A Exhibit No. 14?

Q Yes, sir.
A Yes.
Q Do you see in the bottom middle someone has written in handwriting, "Assigned: Suttie"?
A I see that.
Q And this is a memo from Mr. Hardy, do you see that?
A Yes.
Q Do you see the second sentence of the memo says, "We already provided you with traces of GTCP 331-350 (19 holes)"?
A Yes, I see that.
Q What is the 19 holes a reference to?
MR. McCRACKEN: Objection; no foundation laid for this document.
THE WITNESS: I don't know.
BY MR. PUTNAM:
Q Can you think of anything related to APUs where the phrase or fact of 19 holes might make sense?
A Yes.
Q What's that?
MR. McCRACKEN: Objection; speculation.
THE WITNESS: Can you repeat the question?
(Record read.)
THE WITNESS: On the APS 3200, we have a

19-vane diffuser.
BY MR. PUTNAM:
Q What is a 19-vane diffuser?
A It's a diffuser with 19 vanes.
Q What's a diffuser?
A A diffuser is a piece of metal which takes high velocity gas and converts that to lower velocity, higher pressure.
Q And how does the diffuser used in the APS 3200 perform that function?
A Has 19 vanes, and as the air passes between those vanes, the geometric shape of the vanes reduces the velocity and increases pressure.
Q Where are those 19 vanes located in the APU?
A At the exit of the load compressor.
Q And am I right that the Allied Signal 351-350 also has a 19-vane diffuser?
A I do not know.
Q Do you sometimes refer to the APS 3200's 19-vane diffuser as having 19 holes?
A No.
Q Okay. You see the reference in Exhibit 14 to "our engine Q21"?
A Yes.

Q Am I correct that that was a test engine for your development of the APS 3200?
A No.
Q What is the Q21?
A It was a qualification engine.
Q A qualification engine in the process of developing the 3200, correct?
A No.
Q Okay. What kind of qualification was it?
A Not in developing the 3200. In qualifying the 3200.
Q Did the Q21 have a 19-vane diffuser?
A I don't recall.
Q Can you think of anything else that Mr. Hardy might have meant by referring to the Q21 as having 19 holes?
A I can't think of anything else.
Q Now, when Mr. Hardy said he already provided you with traces of the Allied Signal 331-350 diffuser, is that the data that's contained in Exhibit 13 or is that something different?
MR. McCRACKEN: Could you repeat the question, please.
(Last question read.)
THE WITNESS: I don't know.

BY MR. PUTNAM:
Q Well, looking at the data that's attached to Exhibit 13, can you tell me what that data shows or reflects?
A No, I cannot.
Q And the fact that the first page of Exhibit 13 says, "The traces attached give the value of the static pressure in the diffuser (average value of 19 holes)," that doesn't give you a hint as to the data that's attached in Exhibit 13?
A You asked me if I knew, not if I had a hint.
Q Do you have any understanding of whether the data that's attached to Exhibit 13 is the data that's referred to in Exhibit 14?
A I do not.
Q Must have been some lunch.
Let me ask this to be marked as Exhibit 15, please.
(Deposition Exhibit 15 marked.)
MR. McCRACKEN: I object to counsel's last comment on the record.
MR. PUTNAM: I object to the coaching that obviously took place of this witness during lunch.
MR. McCRACKEN: There is no indication that that has happened, and we resist any implication that

that is true.
BY MR. PUTNAM:
Q Mr. Suttie, I hand you Exhibit 15 which is a one-page Coordination Memo dated October 8th, 1992 with production number HSB 215491. Do you have that document in front of you, sir?
A Yes.
Q And do you see that there is a cc to yourself handwritten in the bottom middle of this document?
A Yes.
Q And do you see that Mr. Tuquoi -- and do you see that this memo is also talking about addressing that delta P/P issue that you were having in the 3200?
A Yes.
(Deposition Exhibit 16 marked.)
BY MR. PUTNAM:
Q Mr. Suttie, the court reporter has handed you what's been marked as Suttie Deposition Exhibit No. 16 which is a one-page Coordination Memo dated February 2nd, 1993 with production number HSB 215454. Do you have that document in front of you?
A 215454?
Q Yes, sir.
A Correct.
Q And do you see in the bottom middle of this

document is handwritten, "Assigned - Suttie"?
A Yes.
Q Can you tell me what this document is talking about, sir?
A Would you like me to read it now and understand it?
Q Sure.
A Can you repeat the question, please.
(Record read.)
THE WITNESS: It's talking about the control of the load compressor.
BY MR. PUTNAM:
Q I see a phrase that appears a couple times that says "transient band." Do you see that?
A Yes.
Q What does a transient band mean?
A It's the margin afforded in the control system to allow for transient operation of the load compressor.
Q And what do you mean by "transient operation of the load compressor"?
A Nonsteady state.
Q For example, situations where the load compressor was quickly turned on and then turned off?
A No.
Q All right. Then what do you mean by "nonsteady

state"?
A When the required air flow from the aircraft changes.
Q And is there a connection between the transient band and the prevention of surge?
MR. MCCRACKEN: Objection; ambiguous.
THE WITNESS: Can you repeat the question, please.
(Last question read.)
THE WITNESS: Yes.
BY MR. PUTNAM:
Q What's that connection?
A The surge occurs at a certain value of delta P static on P static. The control is trying to maintain surge-free operation and, as mentioned here, the transient band is the delta between the two.
Q The delta between which two?
A Load compressor surge and the point at which the control system is trying to maintain operation.
Q So is it fair to say the larger the transient band is, the larger your margin of error is before you get to surge?
MR. MCCRACKEN: Objection; the question's unclear.
THE WITNESS: Yes.

BY MR. PUTNAM:
Q Do you see, I think it's six lines down from the top of this memo, there's a sentence that starts near the right-hand margin with the words, "So the loss of."
A Yes, I see that.
Q Can you read into the record the memo starting with those words through the end of the page, please.
A "So the loss of surge margin due to transient band would be 20%. For comparison on the GTCP 331/350, the transient band loss given by Garrett is only 5% on surge margin. Around delta P/P approximately .2, this loss corresponds to a 6% transient band on delta P/P which is the target value because MES conditions."
Q What are NES conditions?
A MES.
Q What are MES conditions?
A Main engine start.
Q Was 6 percent transient band the target value for Sundstrand?
A No.
Q Then what was the 6 percent transient band the target for?
A It was Turbomeca's request.
Q So Turbomeca wanted Sundstrand, in its work on

its part of the 3200, to have a 6-percent transient band; is that right?
A That's my understanding of this.
Q And am I right that at the time this memo was written, Sundstrand's transient band was approximately 20 percent?
A Reading the memo, that's how I read the memo.
Q And am I right that what Turbomeca is saying to you is that high of a transient band is not suitable for main engine start conditions?
A No.
Q What is the phrase "not suitable for main engine start conditions" right before the portion of the memo that I just had you read, a reference to then?
A Can you repeat that, please.
(Last question read.)
THE WITNESS: I don't recall.
BY MR. PUTNAM:
Q And looking now, do you have any understanding, sir, as to what that reference is?
A No.
Q As a designer of a control system for an APU, would you strive to have a larger or smaller transient band?
A One would strive for the smallest band

possible.
Q Why is that?
A To minimize wasted performance.
Q In what sense does a larger band waste performance?
A It would mean that more of the load compressor air was being bypassed and not provided to the aircraft.
Q In other words, more of the air that's being drawn in by the load compressor is being dumped out the surge valve as opposed to being provided to the aircraft, correct?
A Yes.
Q What is the transient band on the APS 3200 in operation today?
A I don't know.
Q Approximately what?
A I don't know.
Q Is it less than 20 percent?
A I don't recall.
Q Am I right that you do know that it's not as low as 5 percent?
A I don't recall.
Q Can you turn back to Suttie Exhibit 9, please, which is the Revision N document that we were looking at this morning. And let me direct your attention to

Page 62 of the document which has production number HSA 96854.
A Page 62?
Q Yes, sir. Do you see the subheading near the top of the page, "3.3.4.4 Closed Loop Load Compressor BCV Control"?
A I do.
Q Am I correct that the text under that heading describes the operation of the bleed control valve in the APS 3200?
A Yes.
Q What does the phrase "closed loop" connote in that heading?
A A control where a parameter is sensed and fed back to a summing junction, thus making a closed-loop.
Q What parameter or parameters are sensed and fed back in operation of the APS 3200 bleed control valve?
A The parameter that is sensed are two: Delta P/P, delta P static over P static, and also the bleed control valve position.
Q And are both of those parameters then fed back to a summing junction?
A Yes.
Q Am I correct from the first sentence under 3.3.4.4 on Page 62 of Exhibit 9 here that the electronic

control box is to operate the bleed control valve to maintain surge-free operation of the load compressor?
A What's the question?
MR. PUTNAM: Can you read it back, please.
(Last question read.)
THE WITNESS: Yes.
BY MR. PUTNAM:
Q How much flow rate do you need to bring in through the load compressor to prevent surge?
A I don't know.
Q Am I right that in the APS 3200, you need to bring in at least a certain level of air flow through the load compressor in order to prevent surge?
A Yes.
Q And how is it that you determined how much air you need to bring in through the load compressor to prevent surge?
A We have a relationship between delta P static divided by P static which corresponds to air flow.
Q And as long as that air flow -- and the delta P/P relationship, that's something that you figured out in the course of designing the 3200 bleed control valve system, correct?
A No.
Q When did you determine that?

A It was provided by Turbomeca.
Q Okay. When did Turbomeca provide that?
A I don't recall.
Q Was it before you started working on the APS 3000 which became the 3200?
A No, it was not.
Q We were looking at some memos from October 1992. Was it before October 1992?
A I don't recall.
Q Where did they get that relationship from?
A I don't know.
Q Did they get it from their experience on the Allied Signal 331-350 APU?
A I don't know.
Q How is it that bringing a substantially constant level of flow through the surge compressor -- I'm sorry, start over again.
How is it that bringing a substantially constant level of air flow through the load compressor prevents surge?
MR. MCCRACKEN: Objection; it assumes a fact not in evidence.
THE WITNESS: Can you repeat the question.
(Last question read.)
MR. MCCRACKEN: Further objection; ambiguous.

THE WITNESS: I don't know.
BY MR. PUTNAM:
Q What do you mean, you don't know?
A That would be the information that a performance engineer would be able to supply.
Q So is it your testimony that you know that that does prevent surge, you're just not sure how it does that; is that fair?
A Yes.
Q Am I right that the amount of air demanded by, as you referred to it earlier, the customer changes during operation of the APU?
A Yes.
Q In other words, sometimes the aircraft demands more air or less air while the APS 3200 is in operation, correct?
A Correct.
Q And am I correct that operation of the bleed control valve in the APS 3200 is designed to insure that you can meet that variable need for air while at the same time preventing the occurrence of surge?
A Can you define what you mean by "variable need for air"?
Q Sometimes the aircraft needs more air, sometimes it needs less air.

A The BCV does not accomplish that function.
Q What accomplishes that function in the APS 3200?
A The inlet guide vanes.
Q How do the inlet guide vanes accomplish that function?
A They move.
Q And what does that do?
A Allows more or less air into the load compressor.
Q And am I right that the bleed control valve allows you to get rid of excess air, where the load compressor has brought in more than the aircraft needs at that particular time?
A Yes.
Q And am I correct that if you didn't have a functioning bleed control valve, there would be a risk of surge at periods when you brought in more air through the load compressor than the airline needed -- than the airplane needed at that particular time?
A There would be a risk.
Q How many different settings does the bleed control valve in the APS 3200 have?
A I need clarification of the question. Which control system are you talking about? N?

Q The current APS 3200. How many different settings does the bleed control valve have?
A The bleed control valve itself doesn't have settings.
Q How many different locations can the bleed control valve be in during operation of the APS 3200?
A An infinite number.
Q Okay. I take it in theory at least, the bleed control valve could be all the way open during operation of the APS 3200, correct?
A Yes.
Q And am I right, just so we have the terminology right, that if it was all the way open, all of the air would be being exhausted out and none would be going to the airplane; is that correct?
A It's the reverse.
Q Okay. That's why I need to get the terminology. If you were to hear the phrase "the bleed control valve is all the way open," am I correct that what you would understand by that is that all of the air is going to the airplane and none of it is being dumped out of the system, correct?
A Correct.
Q And am I right that it's also possible for the bleed control valve to be all the way closed during

operation of the APS 3200?
A Yes.
Q And again, so we have the terminology, that would mean none of the air is going to the aircraft and all of it is being dumped off, correct?
A In the situation where the bleed control valve is closed, the aircraft is not requiring pneumatic air.
Q Okay. And am I right from your earlier testimony that there are an infinite number of variations between all the way opened and all the way closed of where the bleed control valve can be during operation of the APS 3200?
A Yes.
Q Am I right from exhibit -- I'm sorry, Exhibit 9, Page 62, that Figures 12A to D of this document show the control algorithms and logic for operation of the bleed control valve?
A Yes.
Q Let me ask you please to turn to those diagrams starting with Figure 12A on Page 128. Can you tell me what Figure 12A shows, please?
A It shows the closed-loop PI surge control.
Q And what do the initials PI stand for in that context?
A Proportional plus integral.

Q Okay.
MR. PUTNAM: Why don't we -- off the record.
(Recess.)
MR. PUTNAM: Can you mark that as Exhibit 17, please.
(Deposition Exhibit 17 marked.)
MR. PUTNAM:
Q Mr. Suttie, I've handed you what the court reporter has marked as Exhibit Suttie 17 which you will see is a stand-alone copy of Page 128 out of Exhibit 9 with production number HSA 96920. Do you have that in front of you, sir?
A 96920, yes.
Q Okay. And would you agree with me that that's also a -- a picture of Figure 12A out of Exhibit 9?
A Yes.
Q Let me give you a blue marker. Can you depict on Exhibit 17 where the fact of measuring delta P/P takes place in this logic diagram? And if you want to draw a circle around part of the diagram or draw an arrow towards part of the diagram, however you think will be clearest, but I'd like you to label with a 1 the measurement of delta P/P.
A Delta P/P itself is not measured as an individual parameter.

Q Okay. Am I correct that the diagram shows separate measurements of delta P and P?
A Correct.
Q And then the diagram shows a calculation where delta P/P is calculated?
A Correct.
Q Okay. Can you depict with a 1 -- again, if you want to draw an arrow to it or a box around it, however you think is clearest -- the calculation of delta P/P as it's depicted on Figure 12A.
Okay. Why don't you hang on to Exhibit 17. I'm going to ask you to show some other things there.
Now, am I correct that the two inputs that are sensed in the system that lead to that calculation, there's a sensing of delta P and a sensing of P; is that correct?
A Both static pressures, that's correct.
Q Okay. Where is the -- what's labeled here as PS, do you see the reference to PS?
A Yes.
Q And that would be static pressure?
A Correct.
Q Where is that sensed in the APU?
A At the inlet to the bleed control valve.
Q Am I correct that in the APS 3200, there are --

or there is a duct between the outlet of the load compressor and the inlet of the airplane?
A Yes.
Q And is the sensor for measuring PS or static pressure, is that sensor somewhere in that duct?
A Yes.
Q Okay. Now, the reference that's labeled here as DELP, do you see that on Exhibit 17?
A I do.
Q And that's what we've been referring to as delta P, right?
A Delta P static, correct.
Q Okay. And where is that sensed in the APS 3200?
A It's a delta pressure, so there are two sense ports.
Q Okay. Where are the two places that it is sensed?
A One is in the diffuser of the load compressor, and the other is the PS we've been talking about.
Q So the delta P value uses both that same sensor that we discussed earlier and a second sensor in the diffuser of the load compressor, correct?
A No.
Q Okay. What's wrong about that statement?

A The PS is an individual sensor. The parameter is sensed by an additional sensor which is a delta P sensor.
Q Are there one sensor or two sensors that leads to the delta P variable?
A One.
Q Where is that physically located?
A On the plenum of the APU.
Q Is that delta P sensor located in the duct between the outlet of the compressor and the inlet of the aircraft?
A Can you repeat the question, please.
(Last question read.)
THE WITNESS: No.
BY MR. PUTNAM:
Q Where is that sensor?
A It's on the plenum of the APU.
Q What is the plenum of the APU?
A The inlet.
Q On the inlet guide vanes?
A No, the inlet plenum.
Q Define the word "plenum" for me.
A Area, volume.
Q Where in the area of the APU is the delta P sensor located?

A On the outside surface.
Q Is the delta P sensor located downstream of the inlet guide vanes?
A Can you define what you mean by "sensor"?
Q Well, as I understand your earlier testimony -- and maybe I'm mistaken -- as I understood your earlier testimony, there is a physical sensor -- let me back up and do it this way. Maybe I understand the confusion.
The delta P variable is an input into the logic sequence shown on Figure 12A, correct?
A Correct.
Q How is that input generated?
A Two pressures are ducted to a sensor, and that sensor measures the difference between the two pressures.
Q Okay. Where are the two pressures themselves measured to then be ducted to a sensor?
A One is the diffuser and the other is the BCV.
Q Okay. Is the diffuser where one of those two measurements takes place in the duct between the outlet of the compressor and the inlet of the airplane?
MR. MCCRACKEN: Objection; ambiguous.
THE WITNESS: What do you mean by "outlet of the compressor"?
BY MR. PUTNAM:

Q The place where the air drawn in by the compressor is exiting the compressor to go to the rest of the system.
A I'm confused. I need to know what you mean by "compressor" and "system."
Q Okay. Well, what does a compressor look like?
A That's a question?
Q Yes, sir.
A It's a round wheel made of metal.
Q And in the APS 3200, the compressor draws in ambient air, correct?
A Yes.
Q And after ambient air is drawn in through the compressor, the air travels through the diffuser, correct?
A Correct.
Q And then the air travels to the bleed control valve, correct?
A Yes.
Q And then it travels either to the airplane or is dumped out, correct?
A Yes.
Q So the diffuser is in the duct from the compressor -- start over again.
So the diffuser is in the duct between the

compressor, that round metal wheel, and the airplane, correct?
A It's between them, yes.
Q And there is a duct that runs between the compressor and the airplane, correct, in the APS 3200?
A What do you mean by "duct"?
Q Well, what do you understand by the word "duct"?
A To me it's a round tube.
Q Okay. Is there some sort of tube between the compressor and the airplane through which the air travels?
A No.
Q Are there a series of ducts between the compressor and the airplane?
A There are a series of parts between the compressor and the airplane.
Q And are those parts enclosed so that air that's brought in through the compressor actually gets to the airplane?
A Yes.
Q What's the difference between a series of ducts, which was my question, and a series of parts, which was your answer?
A I do not consider the diffuser to be a duct.

Q Okay. What does the diffuser look like?
A Can you clarify how I'm to answer that question?
Q Well, I asked you earlier what a compressor looked like and you told me a round metal wheel. That was helpful. What does a diffuser look like? If we had one on the table between us, what would we be looking at?
A Another round piece of metal with a large hole in the middle of it.
Q And this is the thing that in effect has 19 separate surfaces or holes --
A Yes.
Q -- in the APS 3200?
And are they separate surfaces -- are there 19 separate surfaces that the air travels past or through as it goes through the diffuser?
A Yes.
Q And is there something that connects the outer edges of the surfaces together?
MR. MCCRACKEN: Objection; ambiguous.
THE WITNESS: Can you define what you mean by "connects"?
BY MR. PUTNAM:
Q Sure. As I understand what your testimony is,

the diffuser consists of 19 separate surfaces that the air goes through, having been drawn in through the compressor. And my question is, how are those surfaces attached together so that the air, having gone through surface No. 1, doesn't just escape out into the atmosphere as opposed to going through surface No. 2?
A They don't follow that 1-2 path.
Q How do they work?
A The air goes through one path, and a different set of air molecules will go through a different air path.
Q But is the diffuser 19 separate surfaces that the air goes through serially?
A No.
Q Let me hand you a sheet of yellow paper, and can you please draw the diffuser for the APS 3200 so we can have a common understanding of what this is?
MR. MCCRACKEN: Counsel, you're asking him to draw the diffuser to the best of his ability, or draw the diffuser?
MR. PUTNAM: He's been describing in words what the diffuser looks like. I have not been following him. I'm not criticizing the witness, I just haven't understood what he's saying. So in order to move things along, I'm going to ask him to the best of his ability

to draw the diffuser for the APS 3200 in hopes that we can move forward on that basis.
THE WITNESS: Excuse my art.
Two views of the one part. It's a large circular, like I mentioned, with a hole in the middle of it. If you turn it around it would be like this. These are considered diffuser vanes.
BY MR. PUTNAM:
Q And where does the -- where is the compressor in relation to that?
And how much difference -- how much distance is there between the compressor and the diffuser on the APS 3200?
A I don't recall.
Q Is it less than an inch?
MR. MCCRACKEN: Objection; it's ambiguous.
THE WITNESS: It's less than an inch.
BY MR. PUTNAM:
Q And what is it to prevent the air from just going right through the middle of the diffuser as opposed to touching any of the separate surfaces around the diffuser?
A I don't understand the question.
Q Well, as you've drawn it and as I understand it, the diffuser has a big hole in the middle of it,

correct?
A Yes.
MR. PUTNAM: Okay. Let me ask the court reporter to label that drawing so we have it for the record as Exhibit Suttie 18.
(Deposition Exhibit 18 marked.)
MR. MCCRACKEN: We, of course, would request a copy of Exhibit 18 as well as Exhibit 17.
MR. PUTNAM: We will provide you with one.
Q Turning you back to Exhibit 17, right under the -- right under the delta P and P, there is a line labeled SRGSPT. Do you see that, sir?
A I see it in two locations.
Q Okay. First of all, does that initial stand for surge setpoint?
A Yes.
Q Okay. And do you see a graph in a shadow box out of which comes a line that's labeled SRGSPT?
A Yes, I do.
Q And can you tell me what the surge setpoint as depicted on Figure 12A represents?
A They're our desired delta P on P setpoint.
Q So the variable here, SRGSPT, is the desired delta P/P value in the APS 3200; is that correct?
A Yes.

Q Okay. And am I right that the circle with the plus and minus next to it just to the right of delta PQP is referred to as a summing junction?
A Yes.
Q And am I right that at that summing junction, what happens in the APS 3200 surge control system, that the actual value of delta P/P is compared to the desired value of delta P/P?
A Yes.
Q Can you please label with a 2 the place on Exhibit 17 where the actual and desired values are compared.
And the graph that sets forth the desired value, is that the thing that you've said earlier was supplied to you by Turbomeca during development of the APS 3200?
A No.
Q How is that desired value graph generated?
A Empirically.
Q Okay. Were you involved in that empirical testing?
(Mr. Miller left the deposition.)
THE WITNESS: I was involved with it, yes.
BY MR. PUTNAM:
Q Who was responsible for that empirical testing?

A The design engineer at the time.
Q And who was that?
A Ed Edelman.
Q Was he a Sundstrand employee or a Turbomeca employee?
A Sundstrand employee.
Q Immediately above the desired value graph in line with the delta P and P measurements, there are two boxes that have the initials ZOH. Do you see that?
A Uh-huh.
Q What does ZOH stand for?
A Zero order hold.
Q What does that mean?
A It's a digital sampling of an analog parameter.
Q What's the purpose of doing that at that point in the control logic?
A To measure the data.
Q Okay. And underneath each box I see "T=0.01 sec." Do you see that?
A Yes.
Q What does that mean?
A It's the sampling frequency.
Q So am I right that that means that every hundredth of a second, the value of delta P and P is measured and then fed into the system?

A No, you're not right.
Q What does the sampling frequency mean then?
A Every tenth -- every hundredth -- I apologize, every hundredth of a second.
Q Let me state it again so that the testimony is clear.
Am I correct that what this says is that every 100th of a second, the value of delta P and P is measured and then fed into the system?
A Yes.
Q Okay. Let me take you down the path past the summing junction. I see coming out of the summing junction a variable that is labeled ERRSRG. Do you see that?
A I do.
Q And is that an error signal?
A Yes.
Q And am I right that that error signal represents the difference between the actual delta P/P measurement and the desired delta P/P measurement?
A Yes.
Q And can you indicate with a 3 on Figure 17 where that error signal is.
Now, am I correct that the error signal that you've just labeled with a 3 is then fed into -- is then

simultaneously fed into a proportional controller and an integral controller?
A No.
Q What's wrong with that statement?
A You mentioned proportional plus integral. This is proportional plus integral plus derivative.
Q Okay. Let me take it one at a time. Is that error signal fed into a proportional controller?
A Yes.
Q Can you indicate with a 4 where the proportional controller is depicted on Figure 12A.
A I don't recall.
Q What do you mean?
A I don't recall which of the two lines is the appropriate one.
Q Well, which are the two possibilities that you can't recall between?
A The one which is the initial box is 1 minus Z to the power negative 1 or the one marked "TSAMP."
Q Am I right that one of those lines is the proportional controller and the other line is the integral controller?
A Yes.
Q And am I correct that your testimony is you're

just not sure as you sit here which is which?
A Yes.
Q Doesn't it make sense to you that the one in the next set of boxes down the line which has P as the second letter is the proportional and the one that has I as the second letter is the integral one?
MR. MCCRACKEN: Counsel, where are you referring to? I don't see that.
I withdraw the question.
THE WITNESS: Yes, I could make that assumption. However, it doesn't match with my understanding of the meaning of those blocks.
BY MR. PUTNAM:
Q What's your understanding of the meaning of those blocks?
A The 1 minus Z to the minus 1 as I remember is an integral term.
Q Okay. Let me just do it this way: Am I right that in the operation of the APS 3200, the error signal that we've labeled as S-3 is fed to a proportional controller? I know it's fed to other things, but I'm taking one at a time. It's fed to a proportional controller, right?
A Yes.
Q And am I right that that controller produces a

signal proportionally related to the error signal?
A Yes.
Q And am I right that the error signal is also fed to an integral controller?
A Yes.
Q And am I right that that integral controller produces a signal that is integrally related as a function of time to the error signal?
A What do you mean by "as a function of time"?
Q Let me ask it this way: That integral controller produces a signal that is integrally related to the error signal?
A Yes.
Q And am I right that as depicted in Figure 12A, the integral signal and the proportional signal are then summed?
A Yes.
Q Can you label with a 6 the place on Figure 17 where the proportional and integral signals are summed?
MR. MCCRACKEN: Skipping 5, Counsel? Or was that intentional?
MR. PUTNAM: I'm skipping 4 and 5, yes.
MR. MCCRACKEN: 4 and 5.
BY MR. PUTNAM:
Q And am I right that after the proportional and

integral signals are summed, there is a command that heads towards the bleed control valve?
A Can you define what "heads towards" means?
Q A command that leads to the bleed control valve.
A Do you mean immediately leads towards or --
Q No, sir, eventually leads towards the bleed control valve.
A In some circumstances, yes.
Q All right. Let me ask you -- put aside Exhibit 17 for the time.
Let me ask the court reporter to mark a stand-alone page of Figure 12B as Exhibit 19.
(Deposition Exhibit 19 marked.)
BY MR. PUTNAM:
Q Mr. Suttie, I've handed you what the court reporter has marked as Suttie Exhibit 19 which is a stand-alone copy of what is also Figure 12B in Suttie Exhibit 9, has production number HSA 96921 on it. Do you have Exhibit 19 in front of you, sir?
A Exhibit 19?
Q Yes, sir.
A Yes.
Q Now, am I correct that the output of the control logic shown on Figure 12A is depicted on

Figure 12B as well?
A Can you repeat the question, please.
MR. PUTNAM: Ask the court reporter to read it back.
(Last question read.)
THE WITNESS: Could you define what you mean by the output of 12A?
BY MR. PUTNAM:
Q Well, 12A shows a series of calculations and shows a particular signal exiting on the far right-hand side of Figure 12A, correct?
A Can you name it?
Q Am I correct that Figure 12A shows a signal exiting the logic shown on 12A on the far right-hand side?
A Yes.
Q And is that signal also depicted at the top of Figure 12B?
A No, it is not.
Q Okay. What does Figure 12B show?
A It shows the surge control choked flow compensation logic.
Q What does the phrase "choked flow compensation logic" mean?
A Can you define your question better?

Q I'm just using, sir, the phrase that's on Figure 12B. I want to know what you understand by the phrase "choked flow compensation logic."
A It's logic used to determine the status of the load compressor.
Q Is that your full answer?
A Yes.
Q What does the phrase "choked flow" mean, or connote?
A Choked flow is a thermodynamic phenomena which occurs in gas dynamics.
Q And is it a situation where too much air is being brought in?
A No.
Q Is it a situation where not enough air is being brought in?
A No.
Q What does it mean then, a choked flow?
A It's an aerodynamic function as a result of air passing down the duct in various flows and temperatures.
Q Is choked flow good or bad?
A It is neither good nor bad.
Q Am I right that Figure 12B shows that as part of the surge control on the APS 3200, you measure the position of the inlet guide vanes?

A Can you define what you mean by "part of the surge control"?
Q Figure 12B shows a portion of the logic by which the APS 3200 bleed control valve is operated, correct?
A Can you repeat that, please.
(Last question read.)
THE WITNESS: It shows a portion of the logic.
BY MR. PUTNAM:
Q For operation of the bleed control valve in the APS 3200, correct?
A Can you define what you mean by "operation of the bleed control valve" just so I'm clear.
Q Sir, can you turn back to Page 62 of Suttie Exhibit 9, because I'm just -- we did this before. I don't think this is rocket science. Look at Page 62 of Exhibit 9.
Do you have that in front of you, sir?
A Yeah.
Q Do you see the second sentence under the heading we looked at earlier, 3.3.4.4, it says, "The ECB shall operate the modulating bleed control valve," and then skipping a couple words, "The control algorithms and logic are specified in Figures 12A through 12D"?
A Yes.

Q And am I correct that Figure 12B is among the figures that was referenced in that portion on Page 62?
A Yes.
Q Okay. Am I correct that Figure 12B shows that as a portion of the bleed control valve logic for the APS 3200, you measure the position of the inlet guide vanes?
A Can you repeat that, please.
(Last question read.)
THE WITNESS: This figure shows the bleed select uses IGV position.
BY MR. PUTNAM:
Q Okay. And that's part of the logic of controlling the bleed control valve in the APS 3200, correct? It is an input into that control system, correct?
MR. MCCRACKEN: Objection; there's two questions that's been posed.
BY MR. PUTNAM:
Q Bleed control valve position is an input into the control system that controls the bleed control valve in the APS 3200, correct?
A No.
Q What's wrong with that statement?
A You said "bleed control valve position."

Q Inlet guide vane position is an input into the control system that controls the bleed control valve in the APS 3200, correct?
A No. The bleed control valve is not controlled directly with IGV position.
Q Sir, that wasn't my question. My question is, am I correct that inlet guide vane position is an input into the control system that controls the bleed control valve in the APS 3200?
MR. MCCRACKEN: Is that a question, Counsel?
MR. PUTNAM: Yes.
THE WITNESS: The answer is yes.
BY MR. PUTNAM:
Q Okay. In what way does inlet guide vane position affect operation of the bleed control valve in the APS 3200?
MR. MCCRACKEN: Could you reread the question, please.
(Last question read.)
MR. MCCRACKEN: Objection; assumes a fact not in evidence.
THE WITNESS: IGV position is used to compute a critical pressure ratio.
BY MR. PUTNAM:
Q And what's the critical pressure ratio?

A P7 over P2.
Q What's the purpose of computing that ratio?
A To determine the pressure ratio across the -- I'm sorry. A critical pressure ratio across the load compressor.
Q And what do you do with that calculation?
A It is compared with a measured pressure ratio.
Q And what do you do with that comparison?
A The comparison is fed into an and gate.
Q To a what?
A An and gate.
Q An and gate?
A Yes.
Q And what happens then?
A The output of the -- discrete output of the and gate may or may not change state.
Q I'm sorry? The discrete output of the and gate may or may not change state?
A Correct.
Q What does that mean?
A As a result of the input to an and gate, the and gate receives information from another like, and and gate is the digital discrete device. Its output is either zero or 1. Change state means go from zero to 1 or vice versa.

Q Okay. Let me do it this way: Can you label with a 7 the place on Figure 12B in Exhibit Suttie 19 where inlet guide vane position is measured, the place which shows the measurement of inlet guide vane position.
Is inlet guide vane position measured -- or the measurement shown twice on Exhibit 12B, correct?
A Yes.
Q And is that the same measurement?
A Yes.
Q Why is it measured twice?
A It's not measured twice.
Q Why is it used in two different parts of the 12B logic?
A I'm sorry, I don't understand how to answer the question.
Q All right. Let me take it one step at a time.
Can you label with a 7 both places where the measurement of inlet guide vane position is depicted on Figure 12B.
Okay. Can you label with an 8 the and gate into which that position is fed.
A Okay. Only one of those feeds directly into the and gate.
Q Okay. We've said there are two places where

the measurement of inlet guide vane position is used in Figure 12B. Am I right that one of them feeds directly into the and gate you've labeled with an 8 and the other is used in some processing steps that eventually leads to that same and gate?
A No.
Q What's wrong with my statement?
A The block labeled "less than 20%" is where the IGV position is fed into.
Q Okay. And that then leads to the and gate, correct?
A That leads to the and gate, but at that point it's a discrete value.
Q It's a discrete what?
A Discrete value.
Q Okay. And what happens after the and gate that you've labeled as No. 8 on the logic shown in 12B?
A It leads to an or gate.
Q Okay. Can you label the or gate with a 9.
And what is the function of the or gate that you have labeled with a 9 on Exhibit 19 which is Figure 12B?
A The function of an or gate is to take inputs and create an output as a function of the inputs.
Q Okay. And am I correct that the two potential

outputs of the or gate at the top right of Figure 12B are zero or 1?
A I'm sorry, repeat that.
MR. PUTNAM: Can you repeat the question, please.
(Last question read.)
THE WITNESS: Yes.
BY MR. PUTNAM:
Q Now, I see in parentheses it says "0=low flow" and "1=high flow." Do you see that?
A Yes.
Q What does that mean?
A It's reference information in parentheses.
Q Okay. What does low flow mean in that context?
A Flow which is not a high flow.
Q What does high flow mean?
A The reciprocal. These do not have any values to them.
Q Okay. For operation of the bleed control valve in the APS 3200, what is the implication of a zero coming out of the top right of Figure 12B as opposed to a 1 coming out of the top right of Figure 12B?
A The significance is a selection of whether the parameter termed BCVCTL is used or ignored.
Q In operation of the bleed control valve,

correct?
A Yes.
Q Under what circumstances is the parameter BCVCTL used in operation of the bleed control valve?
A When BLDSEL is zero.
Q And what happens when BLDSEL is 1?
A BCVCTL is ignored.
Q And does not play a role in operating the bleed control valve, correct?
A At that time the bleed control valve is a fixed position.
Q What fixed position?
A Full open.
Q Full open? And in the terminology we had before, full open meant all of the air was going to the aircraft and none was being dumped out, correct?
A Correct.
Q Okay. So as I understand --
A Can we take a break? I'm feeling quite tired.
MR. PUTNAM: Sure.
MR. MCCRACKEN: Before we go off the record, I would like to just make it known that Mr. Suttie has a prior engagement this evening that requires him to leave at 5:15.
MR. PUTNAM: At 5 --

MR. MCCRACKEN: 5:15.
MR. PUTNAM: Okay. You haven't told me that before, but I'm certainly not going to start a pattern of inconveniencing the witnesses, so I'm happy to stop then. I can tell you I'm not going to be done with Mr. Suttie.
MR. MCCRACKEN: We appreciate that.
MR. PUTNAM: I suggest we may want to talk off the record about when we're going to continue his deposition.
MR. MCCRACKEN: Yes, and I believe that he has to check his schedule. We anticipated this possibility, and he needs to go back and discuss his schedule and discuss matters with his wife about that. So we can let you know possibly as early as tomorrow when that could be done.
MR. PUTNAM: Okay. Could we go off the record and discuss this further?
MR. MCCRACKEN: Certainly.
(Recess.)
BY MR. PUTNAM:
Q Let me step back a little from the specifics of the diagrams.
Under what circumstances in the operation of the APS 3200 would you want the bleed control valve to

be full open?
A When the aircraft is requesting air to be delivered and that the aircraft was in a position to receive all the air that they were requesting.
MR. PUTNAM: Let me ask the court reporter to mark as Exhibit Suttie 20, Figure 12C.
(Deposition Exhibit 20 marked.)
BY MR. PUTNAM:
Q Mr. Suttie, I have handed you what's been marked as Suttie Exhibit No. 20 which is Figure 12C from Suttie Exhibit 9, and it has production number HSA 96922. Do you have Exhibit 20 in front of you, sir?
A Yes.
Q Am I right that Figure 12C, among other things, shows how the outputs of Figures 12A and 12B interact to affect the operation of the bleed control valve?
A This figure shows how these inputs from 12A and 12B affect BCVCMD.
Q And is that, the BCVCMD, the command that opens or closes the bleed control valve?
A Yes.
Q And the schematic shown in Exhibit 20 is the bleed control valve itself? Would it be to the right of where it says BCVCMD?
A Yes.

Q Can you draw a box on Suttie Exhibit 20 to depict the actual bleed control valve in the right place in the logical sequence of what's shown here.
And can you label that box "bleed control valve."
Now, I notice on Exhibit 20 you did not draw that box as connected to the line that's labeled BCVCMD. Is there any particular reason you didn't draw the box as connected to that line?
A Yes.
Q What's that?
A There's hardware circuitry in between.
Q So am I right that the signal BCVCMD travels through various hardware circuitry, I guess to the electronic control box, and then circuitry travels to the actual valve to tell it to open or close?
A Yes.
Q Let me ask you to turn back to Figure 17 which was Figure 12A. Do you have that one in front of you? I'm sorry, Exhibit Suttie 17 which was Figure 12A. Do you have that in front of you?
A Yes.
Q And this shows that the output of this control -- this control logic shown in this figure is a variable labeled BCVCTL, correct?

A Yes.
Q And does that stand for bleed control valve control?
A Yes.
Q And am I correct that Figure 12A shows that BCVCTL is calculated based on the sum of the proportional and integral control signals as summed in the device I earlier had you label as No. 6?
A No.
Q Am I correct that Figure 12A shows that the BCVCTL signal is calculated based on the sum of the proportional and integral control signals with a couple of other factors added in?
A With two additional factors.
Q Okay. What are those two additional factors?
A A derivative control term.
Q And that's the thing that's coming up from the bottom of the large box on Figure 12A; is that correct?
A Correct.
Q And what's the other factor?
A I don't recall.
Q Okay. And am I right that the sum of the proportional-integral controls is then summed to those two other factors?
A Can you clarify exactly what you mean by "sum

of the proportional-integral controls"?
Q I think we established in earlier testimony that the proportional-integral controls are summed at a summing junction that you labeled as No. 6, correct?
A The sum of the proportional control times the error plus the integral control times the error are summed at 6.
Q Well, you said earlier that the proportional controller produced a signal that was proportionally related to the error signal, correct?
A Yes.
Q Okay. And that the integral controller produced a signal that was integrally related to the error signal, correct?
A Yes.
Q And that proportionally related signal and the integrally related signal are summed at the summing junction you've labeled as No. 6, correct?
A Correct.
Q And that summing junction produces a value, correct?
A Correct.
Q Okay. Do you know what units that value is expressed in?
A I don't know.

Q Okay. That value is then summed together with two other values at the summing junction that is immediately to the right of the one you've labeled No. 6, correct?
A Correct.
Q And it is out of that second summing junction that the variable BCVCTL is generated, correct?
A Correct.
Q Am I correct that the value of BCVCTL is directly a function of the value generated by summing junction No. 6?
A Can you define what you mean by "a function of"?
Q Well, as the value produced by summing junction No. 6 goes up, so does BCVCTL go up, and similarly, as that value goes down, so does BCVCTL go down, correct?
A I don't know.
Q Why don't you know that?
A Because I need to know the value of LDDES2.
Q Well, the second summing junction shows that all three of those values are added together, correct?
A Correct.
Q And that's what produces BCVCTL, correct?
A Correct.
Q So isn't it correct that as any one of those

three inputs goes up or down, the value of BCVCTL similarly will vary up or down?
A They could compensate each other.
Q What do you mean by "they could compensate each other"?
A One can go up and the other one could simultaneously go down.
Q Holding the other factors equal, as the value produced by summing junction 6 goes up or down, the value of BCVCTL will go up or down accordingly, correct?
A Correct.
MR. PUTNAM: May I have this marked as Exhibit 21.
(Deposition Exhibit 21 marked.)
BY MR. PUTNAM:
Q Mr. Suttie, I've handed you what's been marked as Suttie Exhibit No. 20. And first of all, let me explain for your benefit and for the record what this is.
I've taken Page 118 of Suttie Exhibit 9, which is labeled Control System Overview, and has three overview diagrams, one for fuel control, one for BCV control and one for IGV control. Because the BCV control was fairly small there, I have blown up that portion of Figure 8 from Suttie Exhibit 9, which is

HSA 96910, to what is now in front of you as Suttie Exhibit 20. So Suttie Exhibit 20 is an excerpt -- I'm sorry, Suttie Exhibit 21. So Suttie Exhibit 21 is an excerpt from one of the figures found in Suttie Exhibit 9. Do you understand that?

A Yes. Can you repeat which figure number it was?

Q Sure, Figure 8 on Page 118 is what this is an excerpt from. Do you see that?

A Yes.

Q Okay. Now, am I correct that the top left box on Exhibit 21 is a depiction of Figure 12A which we looked at earlier as Exhibit 17?

A Yes.

Q And that box shows the various inputs that Figure 12A uses and then the output that Figure 12A produces, correct?

A I need to check it one for one, but that's the intent.

Q Go ahead and check it, because I think it's not only the intent but is in fact what is shown.

A Yes.

Q Okay. And am I correct that the box immediately under the Figure 12A box on Exhibit 21 is a summary of the processing that is performed in Figure

12B, what we looked at previously as Suttie Exhibit 19?

A No.

Q What's incorrect about that?

A Figure 12B shows an input of DELPQP which is not shown here.

Q Okay. But for that, am I correct that the box that's labeled 12B on Exhibit 21 shows all of the other inputs that come into Figure 12B and it shows the one output that comes out of Figure 12B?

A With that exception, yes.

Q Okay. Now, staying on Exhibit 21, do you see that there are a series of arrows that are shown as going into Figure 12C?

A Yes.

Q And one of those is the output from Figure 12A, correct?

A Correct.

Q And one is the output from Figure 12B, correct?

A Correct.

Q And am I correct that another one of the inputs that goes into Figure 12C is inlet guide vane position?

A Correct.

Q How is inlet guide vane position being used as a separate input into Figure 12C?

A It's used in sequencing logic.

Q And how is it used in sequencing logic?

A When the aircraft requires pneumatic air for the first time, we go through a sequence to open valves and supply the air. We need to do the sequence one activity after another.

Q Okay. Does Figure 12C only affect that period of initial start-up of the airplane?

A No.

Q All right. Let me see if I can -- first of all, would you agree with me that the intent of the summary chart that I have shown here on Exhibit 21 from your diagram is to show a summary of the overall logic for the control of the bleed control valve on the APS 3200?

MR. MCCRACKEN: Objection, if you're relating the question to your intent. Leave it at that.

MR. PUTNAM: Well, it's a diagram that's in his documents, in the Sundstrand documents.

Q Am I correct that the intent of this diagram in the Sundstrand document is to show an overview of the control logic that is used to control the bleed control valve of the APS 3200?

A It's a high-level overview.

Q Of that control logic, correct?

A Yes.

Q Okay. Let me see if I understand how these various parts of the logic fit together.

Figure 12A produces a variable called BCVCTL, correct?

A Correct.

Q Figure 12B then produces or at the same time is producing a variable called BLDSEL, correct?

A Correct.

Q And if BLDSEL is zero, then it is BCVCTL that goes and controls operation of the bleed control valve, correct?

A No.

Q Have I got that backwards? Sorry.

A No.

Q Okay. What's wrong with my statement then?

A There are multiple other points at which the bleed control valve can be moved.

Q Based on other factors, correct?

A Yes.

Q Okay. Can you turn back to -- keep Exhibit 21 in front of you and take a look again at Exhibit 20 which is the blowup of Figure 12C. Do you have that in front of you?

A Yes.

Q All right. Now, Figures 12A and 12B are both

shown on sort of the bottom line of Figure 12C, correct?
A Correct.
Q All right. And I'm going to draw an arrow to a portion of figure -- of Suttie Exhibit 20. See where I've drawn an arrow to? You see that, sir?
A I do.
Q Okay. Am I right that that's a -- that arrow is pointing to a line that in the logic sequence shows a particular value being transmitted through the system?
A Yes.
Q Okay. And that -- where I pointed the arrow, the logic has taken into account the outputs of both 12A and 12B, correct?
A Yes.
Q Okay. And if the BLDSEL variable produced from 12B is zero, then the value where I've put the arrow is whatever the value coming out of Figure 12A was, correct?
A Correct.
Q And what is the value at the place where I put the arrow if BLDSEL was 1?
A KSRGMX.
Q Okay. And if the value where I put the arrow is KSRGMX, does that automatically mean that the bleed control valve is going to be full open when it receives

that signal?
A No.
Q Okay. I thought you said earlier that when bleed select was 1, that meant the valve was full open. Was that not right or did I mishear you?
A There's -- as I understood your question, when the blue arrow equals KSRGMX does not immediately mean the BCV will be full open.
Q Well, but is there anything that can happen to the control signal before it gets to the bleed control valve that could produce a result other than the bleed control valve being full open?
A Yes.
Q And what sorts of things could happen?
A Positive rate limit.
Q What's a positive rate limit?
A It's a device intended to prevent the BCV moving too quickly.
Q So the signal where I have the arrow might be telling it, go full open, but the positive rate limit might modulate or affect that signal before it gets to the bleed control valve; is that right?
A Yes.
Q Might anything else happen that would prevent that signal, assuming bleed select was 1, from telling

the bleed control valve to go full open?
A Yes.
Q What?
A The sequencing logic could be commanded to move the BCV.
Q So is it fair to say that the output of Figure 12B will determine what the signal is at the place I put the arrow in the control logic on Exhibit 20, but whether the output has told the signal at that point to pay attention to Figure 12A or to go full open, either way, things can happen subsequently in the control logic to affect operation of the bleed control valve?
MR. MCCRACKEN: Objection; the question can't be understood.
THE WITNESS: Can you repeat the question, please.
MR. PUTNAM: Let me ask the court reporter to read it back.
(Last question read.)
THE WITNESS: Can you rephrase the question, please?
BY MR. PUTNAM:
Q No. I mean, I understand it's a long question, but there's a lot of different steps involved here. Can

you answer the question I've asked?
A I'm not sure what the question is.
Q Let me get at it this way: Let me ask you to turn back to Suttie Exhibit 19, Figure 12B. Am I correct that holding other factors equal, the inlet guide vane position will affect the calculation of the BLDSEL variable from Figure 12B?
A No.
Q What's wrong with that?
A If delta -- DELPQP exceeds .35, movement of the IGVs will not have any effect on BLDSEL.
Q Okay. And if delta P/P exceeds .35, would that happen in normal operation or would that be an unusual value for delta P/P?
A That would be normal operation.
Q Okay. Am I correct that in Figure 12B, when delta P/P is not greater than .35, the position of the inlet guide vanes will affect the value of BLDSEL?
A Yes.
Q And am I correct, looking at Suttie Exhibit 20, Figure 12C, that the value of BLDSEL will affect whether BCVCTL plays any role in operation of the bleed control valve?
A Can you repeat that, please.
(Last question read.)

THE WITNESS: Yes.
BY MR. PUTNAM:
Q Okay. Figure 12C is labeled "BCV Altitude Lock-out, Authority Limit, Rate Limit and Sequencing Logic." Do you see that?
A Which exhibit?
Q Exhibit Suttie 20, Figure 12C.
A Can you repeat?
Q Sure. Do you see at the bottom where it says 12C, it includes altitude lock-out, authority limit, rate limit and sequencing logic?
A Yes.
Q Am I right from your earlier testimony that sequencing logic relates to the very initial start-up of the APU?
A No.
Q Okay. What does sequencing logic as it's used in Figure 12C refer to?
A It's sequencing on and sequencing off.
Q Okay. So it's the sequencing at the very initial start-up and the very end power-down of the APU?
A No.
Q All right. Just tell me what sequencing logic means then.
A When bleed is commanded on and bleed is

commanded off.
Q When you say "bleed is commanded on or off," you mean the bleed control valve is commanded to start moving and stop moving?
A No, I mean the signal from the aircraft requesting pneumatic air.
Q Okay. During normal operation of the APU, will the aircraft continuously start and stop asking for pneumatic air or will it be a continuous request for pneumatic air, albeit at different volumes?
A Under normal circumstances, it would be -- air would be supplied most of the time.
Q Continuously?
A Not necessarily.
Q Okay. And the sequencing logic affects the operation of the bleed control valve at the very start of the request for pneumatic air and at the very end of such a request, correct?
A Correct.
Q The rate limit that is referred to in Figure 12C, I think you said earlier, affects whether the bleed control valve is being told to open or close too rapidly; is that correct?
A Yes.
Q Okay. What does the authority limit refer to

in Figure 12C?
A Per customer requirements specification, pneumatic supply is not required above a certain altitude. This logic insures that the APU does not provide bleed air above a certain altitude.
Q And can you indicate with the number 9 where the authority limit logic is depicted on Figure 12C.
Okay. And is altitude lock-out something different than authority limit, as it's used in the caption of Figure 12C?
A I don't know.
Q Well, do you understand altitude lock-out to be the same as what you just described as authority limit?
A As I understand it.
Q As you understand it, yes, it is the same?
A Yes.
MR. PUTNAM: Mark that as Exhibit 22.
(Deposition Exhibit 22 marked.)
MR. MCCRACKEN: Do you have a copy for us?
MR. PUTNAM: I'm sorry, I do.
Q Mr. Suttie, the court reporter has just handed you what's been marked as Suttie Exhibit No. 22 which is a document with production numbers HSA 176194 through 176216. Do you have that document in front of you?
A 176216.

Q Yes, sir. Do you have the document in front of you?
A Yes.
Q Okay. Do you see that the first two pages appear to be a handwritten memo for a control systems meeting in March 1990?
A Yes.
Q And do you see that you are listed as the presenter of systems and controls prior experience in the morning of that meeting?
A Yes.
Q Do you recall the meeting that's referenced here?
A No.
Q Do you recall in or about March 1990 a meeting between Sundstrand and Turbomeca to discuss the control system for the APS 3000?
A Vaguely.
Q Okay. Can you look at the pages that follow the agenda in Suttie Exhibit 22 and tell me what those pages generally depict.
A Page 176196 was a system schematic. Page 176197 is an ECB input/output diagram. 176198 is a schematic of a proposed control system.
Q Let me stop you on 176198. Was this the

control system that was proposed for the APS 3000 as of March 1990?
A Yes.
Q And if you look at the top middle of the page in the orientation that you have it, do you see there is a box that says "P-I Controller"?
A Yes.
Q And is that a reference to a proportional-integral controller?
A Yes.
Q And in the system that's proposed here, am I correct that that controller would have issued a surge valve command leading towards the, what was called here, anti-surge valve?
MR. MCCRACKEN: Objection. There is a number of PI controllers on the drawing.
MR. PUTNAM: Yeah, but I'm referring to a specific one that I particularly pointed the witness to.
Q Is my statement correct, sir?
A Yes.
Q And do you see to the left of that particular PI controller, there is a summing junction?
A Yes.
Q And do you see that that summing junction would be comparing an actual measurement of delta P/P to a

setpoint or reference measurement of delta P/P?
A Define what you mean by "actual measurement."
Q Well, a measurement of the delta P/P of the system in operation.
A This system never operated.
Q Yes, sir, but the proposed system that's being depicted here proposed comparing delta P/P as actually measured to a setpoint reference value, correct?
A I can't answer that question.
Q Why not?
A Because you say "actual measurements." There was never an actual measurement.
Q Yes, sir, but when you do a diagram of a system that is proposed, your understanding about how that system would work if it was actually working, right?
A Do you mean that the measured value?
Q Yes, sir. So am I correct that this diagram, page HSA 176198, shows a proposed system in which a measured value of delta P/P would be compared to a setpoint or reference value of delta P/P?
A Yes.
Q And am I correct that the setpoint or reference value of delta P/P in the system proposed on this diagram would be — or would vary as a function of the position of the inlet guide vanes?

A Can you define what you mean by "as a function of"?
Q Do you see that there is a setpoint table in the top center of this figure?
A Yes.
Q And do you see that one of the arrows coming into that setpoint figure is labeled IGV?
A I do.
Q In the system proposed here in this figure, why was IGV going into the setpoint table?
A It was thought at the time that delta P/P setpoint was a function of IGVs. That turned out not to be the case.
Q When you say "it was thought at the time that delta P/P setpoint was a function of IGV," what did you mean by that?
A That we believed that the delta P/P setpoint would be a function of IGVs, by your definition of "as a function of."
Q When had you first formed that belief, that is the belief that the delta P/P setpoint should be a function of the inlet guide vane?
A I don't know.
Q Was that concept for the surge control system something that was generated by Sundstrand or Turbomeca?

A Sundstrand.
Q Okay. Was that generated by other people at Sundstrand or did you play a role in the development of that concept?
A Other people.
Q Who?
A Wendell Reed.
Q And at the time that you started working on the APS 3000 in late 1989, had Mr. Reed already determined to use or to use a delta P/P setpoint that was a function of the inlet guide vanes?
A No.
Q Okay. At some point did you change your mind and decide not to use a delta P/P setpoint that was a function of the inlet guide vanes?
A Yes.
Q And am I correct that in the actual APS 3200, the delta P/P setpoint is a -- well, what's it a function of in the actual APS 3200?
A Inlet temperature.
Q When was the change made from a function of inlet guide vanes to a function of inlet temperature?
A There was multiple steps.
Q Okay. When was the change made away from a function of inlet guide vanes?

A When we found out that the delta P/P curve was not a function of IGVs in the late 1990 time frame.
Q What was it that you found that made you think it was not a function of IGV?
A We were provided information by Turbomeca.
Q You referred to a delta P/P curve. What did you mean by that?
A A relationship between delta P static and P static and air flow, load compressor air flow.
Q And what was it that Turbomeca had told you in late 1990 about that relationship?
A That it was unique, it was not a function of IGVs.
Q What do you mean by "unique"?
A It made no difference what the IGV angle was. The relationship delta P/P static as I've described was a function of flow, independent of IGV angle.
Q And how was it that Turbomeca had determined this?
A I don't know.
Q Who at Turbomeca told you that?
A I received it in a Coordination Memo.
Q And who was the author of the Coordination Memo, do you recall?
A I don't recall.

device.
Q A Venturi flow measuring?
A Venturi.
Q Can you spell that?
A V-e-n-t-u-r-i.
Q What is a Venturi flow measuring device?
A A device which can sense air flow,
Q Okay. And was it measuring -- what was it going to measure, what was the P and what was the delta P?
A The Venturi by its geometry creates a pressure differential in the device itself. The Ps and the Ts were intended to be the pressures as measured by the Venturi.
Q And was this comparing total pressure to static pressure or static pressure to a delta static pressure?
A I don't recall exactly.
Q Okay. In this diagram that we're looking at, the setpoint is expressed as a function of the IGV. You said that then for a period of time the setpoint was a constant figure. And was it after that that the setpoint was expressed as a function of inlet temperature?
A Yes.
Q Am I correct that inlet temperature is directly

Q You said that the determination of the delta P/P setpoint was expressed in a number of different ways during the development of the 3000 and the 3200. How was it expressed after you expressed it as a function of IGV?
A It was not expressed.
Q Well, were there interim steps between as a function of IGV and as a function of inlet temperature?
A No.
Q Starting in late 1990, continuing until the actual production version of the APS 3200, was the setpoint always expressed as a function of inlet temperature?
A No.
Q How else was it expressed?
A Fixed value.
Q And for what period of time was it expressed as a fixed value?
A I don't recall exactly.
Q The delta P/P that is suggested here in Exhibit 22, page HSA 176198, is that the same delta P/P that you measure in the actual APS 3200 today?
A No.
Q How is it different?
A The proposal was using a Venturi flow measuring

related to inlet pressure?
A No.
Q Am I right that as a matter of physics, pressure and temperature have a relationship to each other?
A No.
Q What's the relationship between pressure and temperature?
A Weather.
Q What do you mean?
A Weather.
Q What do you mean by "weather"?
A Any day, there can be a temperature and a pressure. There is no relationship between the two.
Q Who was it that determined that the setpoint in the APS 3200 should be determined as a function of temperature?
A I don't recall.
Q Was it someone at Sundstrand or someone at Turbomeca?
A Someone at Turbomeca.
Q Was that a determination that you or your team played any part in?
A No.
MR. PUTNAM: Let's take a short break.

(Recess.)
BY MR. PUTNAM:
Q Mr. Suttie, can you pull out again Suttie Exhibit 8 which is a document we looked at earlier. Do you have Exhibit 8 in front of you?
A I do.
Q And under the heading of No. 2, do you recall there was a reference to a B. Macarez and data that he had supplied?
A Yes.
Q Can you tell me what Mr. Macarez's full name was?
A Bernie Macarez.
Q Can you tell me what role Mr. Macarez played in the design and development of the APS 3200?
A His function was coordination, liaison between Turbomeca and Sundstrand.
Q And were there particular parts of the APU that he worked on or had responsibility for?
A No.
Q Are you familiar with an individual named Terry Maedche?
A Maedche.
Q Terry Maedche, are you familiar with him?
A Yes.

Q Was he a Sundstrand employee who worked on the design and development of the APS 3200?
A In its latter stages, yes.
Q What do you mean, "in its latter stages"?
A I don't recall exactly when he joined the company, but I think it was 1992, late '92.
Q And what were his duties and responsibilities in the development of the APS 3200?
A System design engineer.
Q A system design engineer?
A Yeah.
Q And what system was he responsible for?
A He worked along with others on the APS 3200.
Q Okay. Did he work on the control systems for the APS 3200?
A Yes.
Q Did Mr. Maedche work on the bleed control valve for the APS 3200?
A Amongst other things, yes.
Q And did you supervise Mr. Maedche in his work on the bleed control valve on the APS 3200?
A No.
Q Did someone else supervise him?
A Someone else was his supervisor, yes.
Q Who was that?

A Steve Lampe.
Q Are you familiar with an Alan Greubel?
A Yes.
Q And who was Mr. Greubel?
A He's another systems design engineer.
Q And did he work on the development of the bleed control valve system for the APS 3200?
A Yes.
Q And what particular role did Mr. Greubel play?
A I don't recall.
Q Are you familiar with a gentleman named Edward Edelman?
A Yes.
Q Who is Mr. Edelman?
A He was another systems design engineer.
Q And did he work on the development of the bleed control valve system for the APS 3200 for Sundstrand?
A Yes.
Q What particular part of the APS 3200 did he work on?
A Can you be more specific?
Q What particular part of the bleed control valve system did Mr. Edelman work on?
A All of it.
Q Did Mr. Edelman have a significant role in

developing the bleed control valve system for the APS 3200?
A What do you mean by "significant"?
Q Did he make a significant contribution to your development of the bleed control valve system for the APS 3200?
A I still don't understand your question.
Q What do you understand by the meaning of the word "significant"?
A A very large contribution.
Q Did Mr. Edelman make a very large contribution to the development of the bleed control valve system for the APS 3200?
A Yes.
Q Are you familiar with an individual named Branch Crooks?
A Yes.
Q Who is Mr. Crooks?
A Another systems design engineer.
Q Did he play a role in the development of the bleed control valve system for the APS 3200?
A Not the initial design.
Q But did he play a role in the subsequent design and development of the bleed control valve system for the APS 3200?

A Yes.
Q Let me see if I can do this. I'd like to get from you every Sundstrand employee who played a role in the development of the bleed control valve system for the APS 3200. And you've told me that you played such a role, you've told me that Mr. Maedche played such a role, that Mr. Edelman played such a role, that Mr. Greubel played such a role, and Mr. Crooks played such a role. Can you tell me anyone else who played a role in the development of the bleed control valve system for the APS 3200 at Sundstrand?
A Yes.
Q Who else?
A Kourosh Mehr-Ayin.
Q Anyone else?
A Steve Lampe.
Q Anyone else?
A Wendell Reed.
Q Anyone else?
A Malcolm McArthur.
Q Anyone else?
A That's all I recall.
Q Can you tell me which of the individuals that we've just described made the most significant role, the largest contribution to the development of the bleed

control valve for the APS 3200?
Let me ask the question again.
Tell me which of the individuals that you've just identified or that I listed for you played the most significant role in the development of the bleed control valve system for the APS 3200.
A In my estimate, that would be Kourosh Mehr-Ayin.
Q Did any other person make a comparable contribution to Mr. Mehr-Ayin or was he alone at the head of the list in your understanding?
A I would say Ed Edelman made a large contribution.
Q Would it be fair to say that Mr. Edelman and Mr. Mehr-Ayin are roughly equivalent in the level of contribution they made to the bleed control valve system of the APS 3200?
A Roughly.
Q And is there anyone else who you would put at that same rough level in terms of level of contribution to the APS 3200 bleed control valve system?
A No.
Q Is there someone at Sundstrand who was responsible for the development of the systems relating to the inlet guide vanes on the APS 3200?

A Can you repeat the question.
(Last question read.)
THE WITNESS: No.
BY MR. PUTNAM:
Q Mr. Greubel, do you know where he worked before he came to Sundstrand?
A Can you be more specific?
Q Well, did Mr. Greubel work for Allied Signal before he came to Sundstrand?
A Yes.
Q Did he work on Allied Signal's APUs before he came to work for Sundstrand?
A I do not know.
Q Does Mr. Greubel still work for Sundstrand?
A He currently works for Sundstrand.
Q Okay. Mr. Edelman, am I correct that Mr. Edelman worked at Allied Signal before he came to Sundstrand?
MR. MCCRACKEN: Objection; irrelevant.
THE WITNESS: I don't recall.
BY MR. PUTNAM:
Q Does Mr. Edelman still work currently for Sundstrand?
A No.
Q Approximately when did Mr. Edelman depart from

Sundstrand?
A Approximately the end of 1995, beginning '96.
Q Do you know where Mr. Edelman works currently?
A I don't know.
Q Do you have any understanding of where he works?
A I could -- no.
Q Has anyone ever told you where Mr. Edelman worked or went to work after he left Sundstrand?
A Yes.
Q Where is that?
MR. MCCRACKEN: Objection; hearsay.
BY MR. PUTNAM:
Q Where was that?
A A company called Capstone.
Q Mr. Maedche, am I correct that Mr. Maedche worked at Allied Signal before he came to Sundstrand?
A Yes.
Q And do you know that Mr. Maedche worked on APUs at Allied Signal before he came to Sundstrand?
A I do not know.
Q Does Mr. Maedche currently work at Sundstrand?
A No.
Q Approximately when did he leave?
A Early '94.

Q And do you know where Mr. Maedche went when he left Sundstrand?
A No.
Q Do you have any understanding or has anyone ever told you where he went?
A No.
Q Mr. Crooks, do you know that Mr. Crooks worked at Allied Signal before he went to Sundstrand?
A Yes.
Q And do you know that Mr. Crooks worked on APUs at Allied Signal before he came to Sundstrand?
A I do not know.
Q Does Mr. Crooks still work for Sundstrand?
A Don't know.
Q Mr. Macarez, the individual we saw in Suttie Exhibit 8, do you know that he worked for Allied Signal before he came to Sundstrand?
A Can you restate the question.
(Last question read.)
THE WITNESS: I don't recall.
BY MR. PUTNAM:
Q Does Mr. Macarez currently work for Sundstrand?
A No.
Q Do you know approximately when he left?
A He never worked for Sundstrand.

Q I thought you had testified earlier that Mr. Macarez was the person responsible for coordinating efforts between Sundstrand and Turbomeca; is that correct?
A Correct.
Q Was he a Turbomeca employee?
A Yes.
Q Do you know if Mr. Macarez still works for Turbomeca?
A I do not know.
Q Was Mr. Macarez -- as of October 1992 when Suttie Exhibit 8 was written, Mr. Macarez was stationed in San Diego; is that correct?
A I don't recall exactly the dates.
Q Well, in general, when he was serving this liaison function, was he physically stationed in San Diego as opposed to France?
A Yes.
Q When did you first learn -- I'm just looking for a date. When did you first learn that Allied Signal was making allegations that the APS 3200 infringed one or more of its patents?
A I don't recall exactly.
Q The lawsuit in this case, the original complaint was filed by Allied Signal I think in May

1999. Do you recall if it would have been before or after May 1999?
A I think it was before.
Q During the time that you were designing and developing the APS 3200, was there ever any consideration about whether that design might infringe someone else's patent rights?
MR. MCCRACKEN: Objection. To the extent that it requests information communicated to him by a lawyer, that information is privileged, and to that extent I would ask the witness not to answer on that. As to other matters, the witness is free to go ahead.
MR. PUTNAM: Well, the question is just a yes or no question. He can give a yes or no answer.
May the court reporter restate the question, please.
(Last question read.)
THE WITNESS: Not that I recall.
BY MR. PUTNAM:
Q To your knowledge, was there any effort undertaken by Sundstrand to determine whether there might be patents on aspects of APU technology that would be implicated by the APS 3200?
A I don't know.
Q Are you aware of any such efforts?

A No.
Q Did you ever direct anyone to undertake a search as to whether there might be patent rights of others that might be implicated by the APS 3200?
A No.
Q Is it fair to say that the development of the APS 3200 took place between late 1989 and 1994?
A No.
Q What period of time would you say the development of the APS 3200 took place during?
A Late '89 through late '93.
Q During the period from late 1989 to late 1993, I take it you were aware that Allied Signal also manufactured and sold APUs similar in size and output to the APS 3200, correct?
A Yes.
Q During that time were there any other companies you were aware of in the world that manufactured and sold APUs of that size?
A None that I was aware of.
MR. PUTNAM: Off the record.
(Discussion off the record.)
MR. PUTNAM: Back on the record.
Can you mark this as the next exhibit, please.
(Deposition Exhibit 23 marked.)

BY MR. PUTNAM:
Q Mr. Suttie, I've handed you what the court reporter has marked as Suttie Deposition Exhibit 23, and let me ask you if you can identify that document.
A It appears to be a Program Management Review.
Q And have you seen documents of this sort inside Sundstrand during your work there?
A Yes.
Q What's a Program Management Review inside Sundstrand?
A A general review of all subjects relating to the APU.
Q Did you play any role in generating or creating the Program Management Review that I've given to you as Suttie Exhibit 23?
A I don't recall.
Q Are Program Management Reviews reviews that are internal to Sundstrand or reviews that take place with external customers?
A Internal with Sundstrand.
Q Typically would this be a review where, for instance, the APS 3200 program team would report on the program to senior management inside Sundstrand?
A No. No.
Q Okay. Let me ask you to turn to HSA 156127

later on off the record. In fact, there's an explicit agreement that damages discovery can go forward now, that liability discovery has an earlier discovery than damages discovery if there's no conclusion on damages discovery. But given I've got eight minutes left with the witness, I'd like to move on.
Q Mr. Suttie, let me ask you to turn to the page with production number HSA 156132. Do you have that page in front of you?
A Yes.
Q And do you see that the lower slide is one labeled "Competition"?
A Yes.
Q What information were you trying to convey to your management with that slide?
A What the competition was.
Q And in October 1996 what was the competition for the APS 3200?
A The Allied Signal 36-300, and in the future, the Allied Signal 131-9.
Q Were any other APUs competition or anticipated competition for the APS 3200 at the time?
A No.
Q Now, under the Allied Signal 131-9, do you see that the first tick mark says "available late 1998"?

which is part of Exhibit 23. Do you have that in front of you?
A Uh-huh.
Q Do you see that the first slide has your name on it and the date October 3rd, 1996?
A Uh-huh.
Q I'm sorry, you need to answer with words.
A Yes.
Q Does that help refresh your memory that at least the portion of the exhibit starting there is something that you presented in October 1996?
A Yes. The program team wasn't there, just me.
Q Okay. To whom did you present these materials in October 1996?
A I don't recall.
Q Was it some part of Sundstrand management?
A Yes.
MR. MCCRACKEN: Jonathan, I believe there's an agreement to limit discovery at this time to liability issues.
MR. PUTNAM: No, sir, there's not.
MR. MCCRACKEN: That the damages portion would -- the discovery would happen downstream.
MR. PUTNAM: Well, first of all, I'd like to finish with this document. I'm happy to discuss that

A Yes.
Q And can you read into the record the next tick mark under that?
A In quotation marks the word "copy of the APS 3200."
Q What did you mean when you conveyed to your management that the Allied Signal 131-9 was a copy of the APS 3200?
A I meant that the APU was geometrically similar to the APS 3200.
Q What do you mean by "geometrically similar"?
A The geometry, size.
Q Okay. How would you know that the Allied Signal 131-9 was a, in your words, copy of the APS 3200?
A I don't recall.
Q What information did you have about the 131-9 at the time that you made this statement in this document?
A I don't recall.
Q Who had told you about the 131-9 to enable you to make this statement in the document?
MR. MCCRACKEN: Objection; assumes a fact not in evidence.
THE WITNESS: I don't recall.

BY MR. PUTNAM:
Q Based on what you know today, is it fair to call the Allied Signal 131-9 APU a copy of the APS 3200?
A Yes.
Q All right. That's all I have on that document for the time being.
Mr. McCracken, you have indicated previously that the witness needs to leave by 5:15. It's now 5:10. In order to accommodate the witness's schedule, I'm happy to suspend the deposition for today. We have discussed off the record rescheduling the deposition or scheduling the continuation of the deposition. I've offered to go forward with Mr. Suttie tomorrow in a simultaneous deposition with him and Mr. Szillat. You indicated that that's not feasible, and I've said I'm happy to work out a mutually agreeable date in the coming week's to continue Mr. Suttie's deposition.
MR. McCRACKEN: Thank you. May we have copies of the exhibits that we currently do not have copies of that we can take with us?
MR. PUTNAM: Could we go off the record?
MR. McCRACKEN: Yes, that's fine.
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I, PETER J. SUTTIE, do hereby declare under penalty of perjury that I have read the foregoing transcript; that I have made such corrections as noted herein, in ink, initialed by me, or attached hereto; that my testimony as contained herein, as corrected, is true and correct.
EXECUTED this ____ day of _____,
19____, at _____.
(City) (State)

PETER J. SUTTIE

STATE OF CALIFORNIA)
: ss
COUNTY OF SAN DIEGO)

I, the undersigned, a Certified Shorthand Reporter of the State of California, do hereby certify:
That the foregoing proceedings were taken before me at the time and place herein set forth; that any witnesses in the foregoing proceedings, prior to testifying, were placed under oath; that a verbatim record of the proceedings was made by me using machine shorthand which was thereafter transcribed under my direction; further, that the foregoing is an accurate transcription thereof.
I further certify that I am neither financially interested in the action nor a relative or employee of any attorney of any of the parties.
IN WITNESS WHEREOF, I have this date subscribed my name.

Dated: _____

JOYCE E. HOSTETLER
CSR No. 5216